

REMARKS

The amendment filed on February 17, 2010 is believed to have been entered. This Amendment is being filed simultaneously with a Request for Continued Examination (RCE). This Amendment serves as a Submission under 37 C.F.R. §1.114.

Claims 9-13, 18-19, 24 and 26-27 are pending in the application. By this Amendment, claims 9, 13 and 19 are amended, claim 17 is canceled without prejudice or disclaimer and new claims 26-27 are added.

The Office Action rejects claims 9, 11-12, 17, 19 and 23 under 35 U.S.C. §103(a) over Embodiment 2 of Takayama in view of Embodiment 8 of Takayama and U.S. Patent Publication 2002/0075206 to Takeda. The Office Action also rejects claim 10 under 35 U.S.C. §103(a) over Embodiment 2 of Takayama in view of Embodiment 8 of Takayama, Takeda and U.S. Patent 6,747,614 to Takayama (hereafter Takayama 614). Still further, the Office Action rejects claim 13 under 35 U.S.C. §103(a) over Embodiment 2 of Takayama in view of Embodiment 8 of Takayama, Takeda and U.S. Patent Publication 2002/0033675 to Kang. The Office Action also rejects claims 18 and 24 under 35 U.S.C. §103(a) over Embodiment 2 of Takayama in view of Embodiment 8 of Takayama, Takeda and U.S. Patent Publication 2002/0063663 to Homma. The rejections are respectfully traversed with respect to the pending claims.

Independent claim 9 recites a plasma display panel (PDP) having scan electrodes and sustain electrodes to form a plurality of electrode pairs, and a first driving circuit configured to successively apply a first signal and a second signal to the scan electrodes before an address period of at least one sub-field. Independent claim 9 also recites that the first signal comprises an

initialing pulse rising to a first maximum voltage value and a first decreasing pulse falling to a first minimum voltage value, and the second signal comprises an enhancing pulse rising to a second maximum voltage value less than the first maximum voltage value and a second decreasing pulse falling to a second minimum voltage value greater than the first minimum voltage value.

In at least one non-limiting example, the present specification describes that in a set-down interval, after a rising ramp waveform Ramp-up is supplied, a falling ramp waveform Ramp-down is applied to all the scan electrodes Y. The falling ramp waveform Ramp-down may cause a fine discharge within cells to uniformly leave wall charges within the cells.

In an enhancing period, a positive enhancing pulse Ramp-p is supplied that rises from a ground voltage GND until a set-up voltage Vsetup. The enhancing pulse Ramp-p may cause a fine discharge such that desired wall charges can be formed at discharge cells. More specifically, negative wall charges may be formed at the scan electrodes Y included in a majority of discharge cells while positive wall charges may be formed at the sustain electrode Z during the set-down period. However, positive wall charges may be formed at the scan electrodes Y included in a portion of the discharge cells. Thus, the enhancing pulse Ramp-p is applied during the enhancing period to thereby form negative wall charges at all the scan electrodes Y. In other words, the scan electrodes Y at which positive wall charges have been formed during the set-down period also pass through the enhancing period to thereby form negative wall charges.

Thereafter, a negative enhancing pulse Ramp-d falling from the ground voltage GND until a voltage $-V_y + \Delta$ may be supplied in the enhancing period. The negative enhancing pulse

Ramp-d falls until a voltage higher than a voltage value of a scan voltage source -V_y such that negative wall charges generated by the positive enhancing pulse Ramp-p are not erased.

The applied references do not teach or suggest all the features of independent claim 9. More specifically, the Office Action (on page 5) asserts that Takayama's FIG. 7 discloses a second decreasing pulse V_{3y} provided after an enhancing pulse V_{2y}. The Office Action also states that Takayama's FIG. 7 does not disclose a first decreasing pulse provided after the initialing pulse V_{1y} during the reset period. The Office Action then cites Takayama's FIG. 15 (Embodiment 8) as disclosing a decreasing pulse V_{22y} after an initialing pulse (believed to be V_{21y}) during a reset period of the at least one sub-field.

The Office Action cites FIGs. 7-8 as corresponding to Embodiment 2 and cites FIG. 15 as corresponding to Embodiment 8. For ease of description, the following description may refer to separate embodiments and/or references when discussing Embodiments 2 and 8.

The Office Action (on page 5) states that the motivation to modify Embodiment 2 with Embodiment 8 is for the purpose of precisely controlling discharge in a display to improve quality of the display and to minimize a number of times needed to do a refresh period. However, the alleged motivation is not based on prior art.

Takayama's FIG. 15 (Embodiment 8) specifically relates to an order for each of the electrodes to perform a charge forming and a charge adjusting. See Takayama's col. 14, lines 26-40. Takayama relies on three kinds of interelectodes XY, XA and YA for different combinations of charge forming and charge adjusting. Takayama applies the ramp waveform pulse to each electrode four times without changing the ramp waveforms. See Takayana's col. 14, lines 26-40.

Accordingly, an alleged first decreasing pulse V22y is equal to an alleged second decreasing pulse V32y.

Accordingly, Embodiment 8 teaches away from positive wall charges at the scan electrodes Y formed during a set-down period are erased by applying a positive enhancing pulse Ramp-p and negative enhancing pulse Ramp-d, and by passing through the enhancing period to thereby form negative wall charges.

Based on this difference, Takayama's FIG. 7 (Embodiment 2) and FIG. 15 (Embodiment 8) may not be simply combined and/or modified as asserted in the Office Action. The Office Action clearly relies on impermissible hindsight to combine these two embodiments.

For at least these reasons, Takayama's Embodiments 2 and 8 do not teach or suggest all the features of independent claim 9. The Office Action (on page 6, lines 3-8) appears to state that Takayama's Embodiments 2 and 8 do not teach or suggest the previously claimed first and second voltage values. The Office Action states that Takeda's FIG. 5 discloses a first gradually falling waveform (A12) is provided until a voltage reaches a first voltage and that a second gradually falling waveform (A13) is provided until a voltage reaches a second voltage value, where the first and second voltages are different. However, the waveform provided in Takeda's FIG. 5 clearly differs from Takayama's Embodiments 2 and 8.

For example, portions A12, A13 of Takeda's FIG. 5 are successively supplied to scan electrodes during a set-down period. Portion A13 facilitates an accumulation of wall charges, while portion A12 facilitate a shortening of the set-up period. See Takeda's paragraph [0110]. This clearly differs from Takayama's Embodiments 2 and 8.

In contrast, FIG. 8 of the present specification discloses a non-limiting example in which a first signal (having a Ramp-up waveform) is supplied to scan electrodes Y in a set-up period (before an address period) of at least one sub-field. In a set-down interval, after the rising ramp waveform Ramp-up is supplied, a falling ramp waveform Ramp-down falling from a positive voltage V_s lower than a peak voltage of the rising ramp waveform Ramp-up is simultaneously applied to the scan electrodes Y. The falling ramp waveform Ramp-down causes a weak erasure discharge within the cells, to thereby erase spurious charges of wall charges and space charges generated by the set-up discharge and uniformly leave wall charges required for the address discharge within cells of the full field.

Independent claim 9 also recites a first signal comprising an initialing pulse rising to maximum voltage value and a first decrease pulse falling to a first minimum voltage value. Takeda's portion A12 does not correspond to the claimed first decreasing pulse.

FIG. 8 also shows a non-limiting example that a second signal (having a second decreasing pulse) is supplied to the scan electrodes Y during an enhancing period separated from the set-down period. In the enhancing period, a negative enhancing pulse Ramp-d falling from the ground voltage GND until a voltage $-V_y + \Delta$ is supplied. The negative enhancing pulse Ramp-d falls until a voltage higher than a voltage value of the scan voltage source $-V_y$ such that wall charges generated by the positive enhancing pulse Ramp-p are not erased.

Independent claim 9 also recites a second signal comprising an enhancing pulse rising to a second maximum voltage value less than the first maximum voltage value and a second decreasing pulse falling to a second minimum voltage value greater than the first minimum

voltage value. Takeda's portion A13 does not correspond to the claimed second decreasing pulse.

Takeda may not be simply exchanged with Takayama's Embodiments 2 and 8 as alleged. The Office Action appears to rely on Takayama's V22y (FIG. 15) as corresponding to the claimed first decreasing pulse, and relies on Takayama's V3y (FIG. 7) as corresponding to the claimed second decreasing pulse. However, Takeda's portions A12 and A13 do not correspond to Takayama's V22y and V3y. The portions A12 and A13 may not be combined with Takayama's FIG. 7 and FIG. 15 as alleged. The combination with Takeda is improper.

For at least these reasons, Takayama's Embodiment 2, Takayama's Embodiment 8 and Takeda do not teach or suggest that the first signal comprises an initialing pulse rising to a first maximum voltage value and a first decreasing pulse falling to a first minimum voltage value, and the second signal comprises an enhancing pulse rising to a second maximum voltage value less than the first maximum voltage value and a second decreasing pulse falling to a second minimum voltage value greater than the first minimum voltage value, as recited in independent claim 9. The other applied references do not teach or suggest the missing features of independent claim 9. Thus, independent claim 9 defines patentable subject matter.

Independent claim 19 recites providing a first signal including an initialing pulse followed by a first decreasing pulse to the scan electrode during an initialization period of at least one sub-field, and providing successively a second signal including an enhancing pulse followed by a second decreasing pulse to the scan electrode after providing the first signal, wherein a lowest voltage of the first decreasing pulse is less than a lowest voltage of the second decreasing pulse.

Independent claim 19 also recites providing a scan signal to the scan electrode during an address period of the at least one sub-field, the scan signal being provided after the second signal in the at least one sub-field, providing at least one sustain signal to at least one of the scan electrode or the sustain electrode during a sustain period of the at least one sub-field, wherein the initialing pulse of the first signal has a first peak voltage value, and the enhancing pulse of the second signal has a second peak voltage value, and wherein the first peak voltage value is greater than the second peak voltage value.

For at least similar reasons as set forth above, the applied references do not teach or suggest at least these features of independent claim 19. More specifically, Takayama's Embodiment 2, Takayama's Embodiment 8 and Takeda (and the other applied references) do not teach or suggest providing a first signal including an initializing pulse followed by a first decreasing pulse, providing successively a second signal including an enhancing pulse followed by a second decreasing pulse to the scan electrode after providing the first signal, wherein a lowest voltage of the first decreasing pulse is less than a lowest voltage of the second decreasing pulse, wherein the initialing pulse of the first signal has a first peak voltage value, and the enhancing pulse of the second signal has a second peak voltage value, and wherein the first peak voltage value is greater than the second peak voltage value. Thus, independent claim 19 defines patentable subject matter.

For at least the reasons set forth above, each of independent claims 9 and 19 defines patentable subject matter. Each of the dependent claims depends from one of the independent claims and therefore defines patentable subject matter at least for this reason. In addition, the

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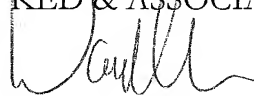
dependent claims recite features that further and independently distinguish over the applied references.

CONCLUSION

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Favorable consideration and prompt allowance of claims 9-13, 18-19, 24 and 26-27 are earnestly solicited. If the Examiner believes that any additional changes would place the application in better condition for allowance, the Examiner is invited to contact the undersigned attorney at the telephone number listed below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this, concurrent and future replies, including extension of time fees, to Deposit Account 16-0607 and please credit any excess fees to such deposit account.

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